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TECHNICAL NOTE 325

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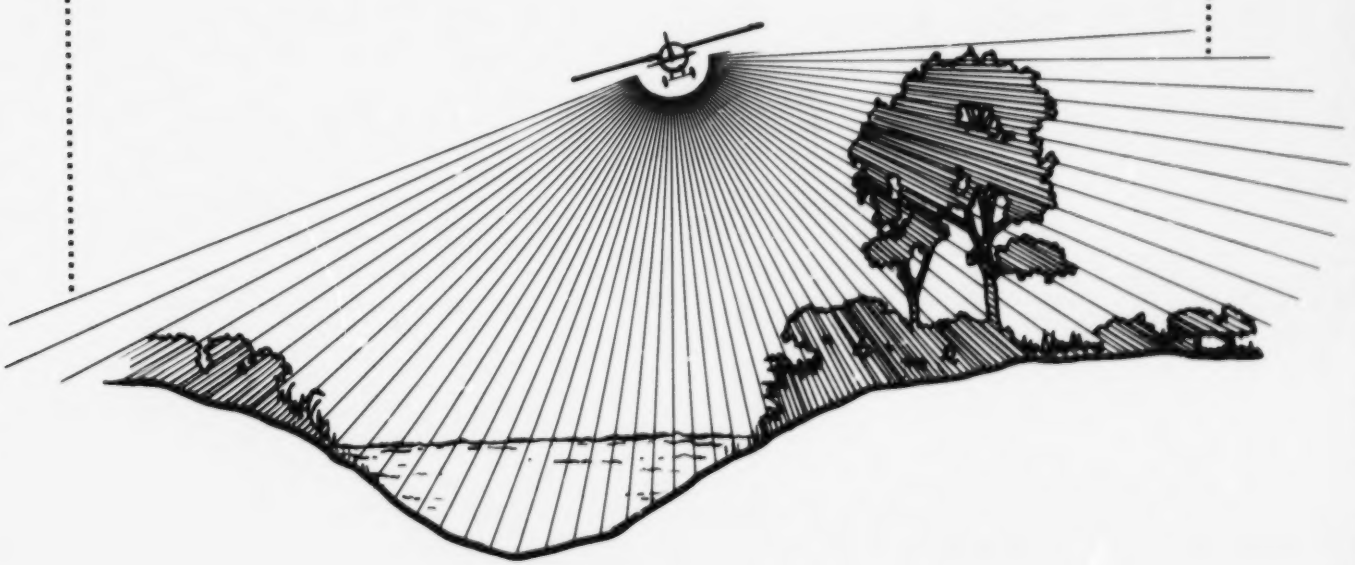
THE USE OF LARGE SCALE COLOR INFRARED PHOTOGRAPHY FOR STREAM HABITAT AND RIPARIAN VEGETATION INVENTORY

by Paul Cuplin



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THE USE OF LARGE SCALE COLOR INFRARED PHOTOGRAPHY FOR STREAM HABITAT AND RIPARIAN VEGETATION INVENTORY

BY

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The Use of Large Scale Color Infrared Photography for Stream Habitat and Riparian Vegetation Inventory

by Paul Cuplin

Introduction

A system of ground data sampling and photointerpretation of stream habitat and riparian vegetation is described. Ground data samples are the basis for photointerpretation and classification of stream habitat and riparian vegetation. Stream habitat is classified for each stream mile by condition class of poor, fair, good, or excellent. Riparian vegetation is classified by dominant and subdominant plant species, delineated and number of acres calculated by using a dot grid or planimeter.

Stream Habitat Inventory

The Stream Habitat Inventory form, Illustration I, is used for both field data collection and photointerpretation. In the field, a 1/10 mile section of stream, on both sides of the stream, is inventoried and the five criteria of percent shade, riparian zone condition, stream bank stability, stream channel stability, and sedimentation of the streambed are recorded. The numerical ratings are added which result in a classification of poor, fair, good, or excellent.

Inventory sites that represent the stream and also have good access are selected for sampling.

The number of samples to be collected should reflect the changes in habitat conditions in the stream. This will not always be known prior to field data collection; therefore, the number of samples must be related to the amount of time available prior to air photography.

Targets

Two targets 2 feet by 10 feet are placed in an identifying pattern at each stream field data collection site.

Map Location

The field data collection site is recorded on a U.S. Geological Survey quad map of the area.

Photo Transect

Three photos upstream, across the stream, and downstream are taken at each stream sample site. The photos assist in photointerpretation and monitoring stream change.

Riparian Vegetation

Riparian field data collection is accomplished according to BLM Manual Section 4412, Physical Resource Studies, .14F3 Riparian Areas, and circular plot form, Illustration II.

A 200-foot long vegetation transect is laid out near the stream field inventory site. Narrow riparian zones dictate that transects be placed parallel to the stream. Each of four circular plots located 50 feet apart are recorded on the circular plot forms.

Shrubs and trees are sketched on the circular plot form and identified by genus and species scientific abbreviation, height, crown diameter, condition, and percent ground cover. The percent of each type of vegetation is recorded.

If prominent vegetation such as cottonwood trees are located in the riparian zone but not in any of the circular plots, appropriate photos or field note description will assist in photointerpretation.

Structure of vegetation is important to wildlife species. The information interpreted from photos will depend upon structural vegetation data collected in the field sample.

Targets

A one-foot wide, four-foot long white target is placed in the center of each plot for photo location.

Equipment and Supplies

Compass
Tape, nylon, 175'
Camera
Color film for prints
Line, 11.7 feet to measure radius of circular transects
Clipboard
Maps of area to be inventoried
Manual Section 4412, Physical Resource Studies
Stream Habitat Inventory Forms
Circular Transect Forms
Photo targets, two feet wide
Photo targets, one foot wide

Aerial Photographs

The Denver Service Center aerial photograph coordinator can provide the specific contract information for stream/riparian vegetation aerial photography.

The specifications will require 58 percent overlap for stereo viewing, continuous endlap for stream photointerpretation, 1/2 f stop overexposure for clear water penetration, color infrared film and 9" x 9" format. Additional specifications will identify the time of day that photos can be taken, for example 10 a.m. to 2 p.m., and the amount of cloud cover acceptable for air photos.

Flight Lines

Flight lines are plotted and numbered to provide the contractor with appropriate directions to accomplish complete aerial photograph coverage of the assigned area.

Photo Scale

The photo scale of 1:1000 is the most desirable for interpreting vegetation and stream habitat conditions. This large scale is not always possible due to steep canyons or other terrain that prevent low flights. Scales of 1:2000 to 1:4800 provide acceptable results.

Photo Quality

The finished aerial photographs are checked by the aerial photography coordinator at the Denver Service Center to determine compliance with flight lines, photo quality, water penetration, stereo coverage, photo scale and other items.

Photointerpretation and Analysis

Equipment

A light table equipped with 9" x 9" rollers and a 10X to 20X stereoscope is required for handling roll film and for photo-interpretation.

Stream Classification

Locate the stream target panels on the aerial photograph. Classify the stream at the ground data site from aerial photograph and record the ratings for the five criteria of percent shade, riparian zone conditions, streambanks stability, stream channel stability, and streambed sedimentation.

Compare the photointerpretation with the ground data classification. If they agree, proceed with photointerpretation by stream mile. Classification of the stream is recorded on appropriate maps.

Riparian Vegetation

Locate the ground transect in the aerial photograph and compare ground data with the aerial photograph. Plant signatures color and texture, will become evident.

Classify riparian vegetation by dominant and subdominant species. The riparian vegetation will be classified for example as cottonwood-willow. The Physical Resource Studies Manual Section would offer a broader classification such as deciduous forest for cottonwood-willow.

The riparian vegetation area is calculated by using a dot grid or planimeter. If the riparian zone is very narrow it may be necessary to use an engineering rule to determine average width and length for area calculation.

Summary

The large scale color infrared aerial photographs provide a baseline level of information that can be used for monitoring change in future years.

The aerial photographs will provide information to many resource specialists. The information available on one photograph is endless.

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Illustration 1

STREAM HABITAT INVENTORY
(This form to be used for field inventory or photo interpretation)

Stream_____ Date_____ Surveyor(s)_____ State_____ Dist._____

Planning Unit_____ Site No._____ Length of Stream Surveyed_____

Field Survey_____ Aerial Photograph_____ (Check one)

% Shade*	80%+	4	60 - 80%	3	40 - 60%	2	40% or less	1
Riparian Zone Condition (% Bare Soil)	5% or less	4	6 - 15%	3	16 -25%	2	25% or more	1
Stream Bank Stability (% Bank Damage)	0 - 10%	4	20% or less	3	40% or less	2	41% or more	1
Stream Channel Stability (% Channel Movement)	5% or less	4	6 - 10%	3	11 - 15%	2	16% or more	1
Sedimentation of Streambed (% Silt)			10% or less	3	11 - 25%	2	26% or more	1
Column Totals	_____		_____		_____		_____	

Stream Condition Rating for Length of Stream Evaluated - (Enter total score in appropriate space)

Excellent 17 ____ Good 14-16 ____
Fair 10-13 ____ Poor 5-9 ____

* Percent Shade is important for 1, 2, 3 order streams but less important to large, wide streams where riparian vegetation cannot affect water temperature by shading.

Illustration II

Date _____

Stream _____

_____

Compass Direction

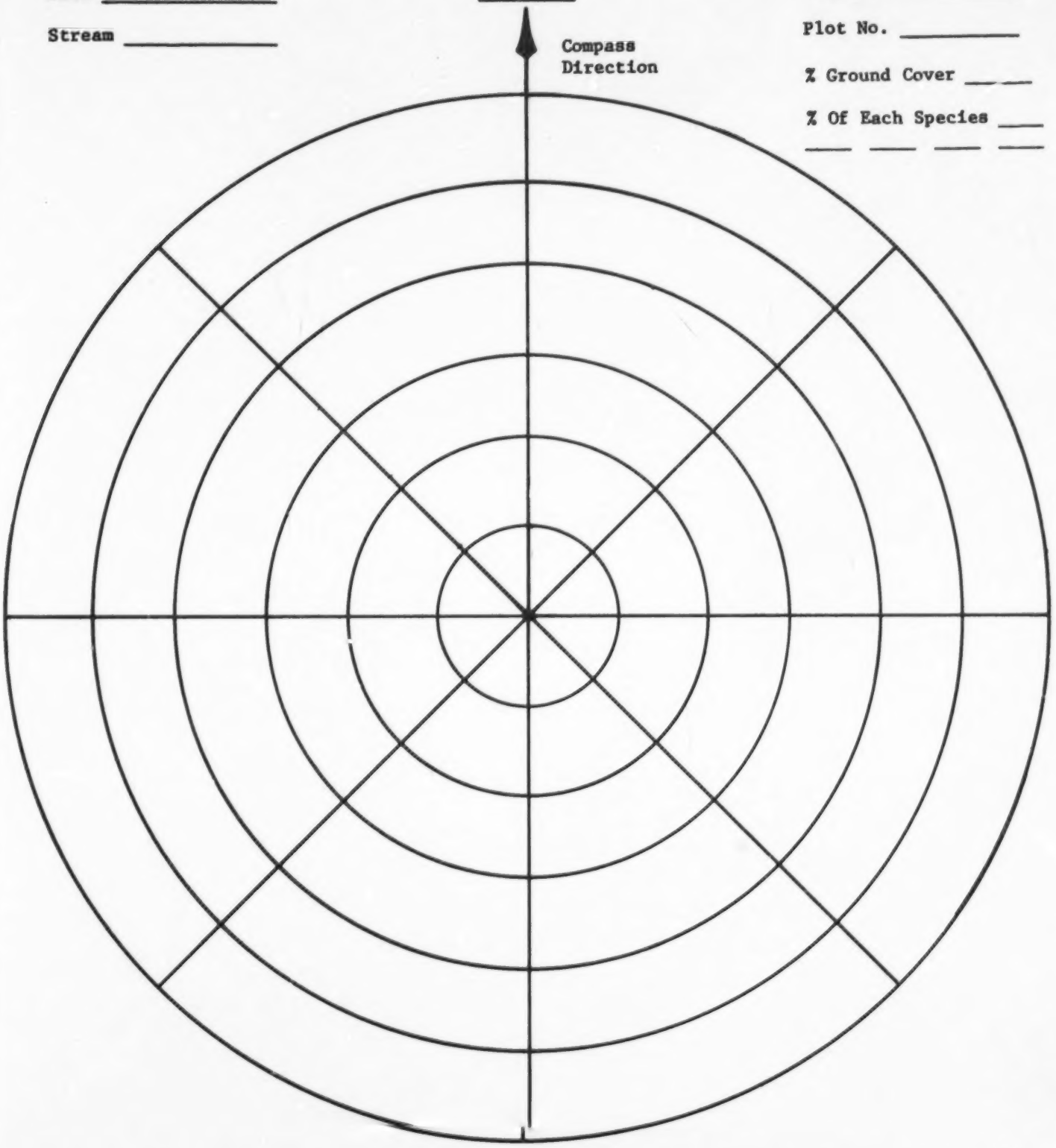
Transect No. _____

Plot No. _____

% Ground Cover ___

% Of Each Species ___

___ ___ ___ ___



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